



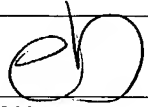
UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|------------------------------|-------------|----------------------|------------------------|------------------|
| 10/037,943 | 01/04/2002 | Stefanie Harvey | AMAT#4561/CPES/CORE/DV | 7783 |
| 23493 | 7590 | 03/22/2004 | EXAMINER | |
| SUGHRUE MION, PLLC | | | CHAUDHRY, SAEED T | |
| 401 Castro Street, Ste 220 | | | ART UNIT | PAPER NUMBER |
| Mountain View, CA 94041-2007 | | | 1746 | |

DATE MAILED: 03/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|-------------------------------|---|
| Office Action Summary | Application No. 10/037,943 | Applicant(s) HARVEY ET AL. | |
| | Examiner Saeed T Chaudhry | Art Unit 1746 |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 17-29, 33 and 34 is/are rejected.
- 7) ☒ Claim(s) 14-16, 30-32, 35 and 36 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>5-28-02</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the pump must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 11 is objected to because of the following informalities: . Appropriate correction is required.

Claim 11 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 11 recite "one or more particular areas of said surface are cleaned to great extent than other areas of said surface", which is a intended use in the future and does not further limit or define the structure of the apparatus being claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-7, 10-13, 18-24, 27-29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wollman in view of Cumming et al or Lambel et al.

Wollman (3,420,710) disclose a method and apparatus for cleaning article such as webs, filaments, film strips, magnetic tape, etc. by using sonic air blast. A process for cleaning the surface or surfaces of shaped articles which comprises (a) exposing a shaped article to a cleaning zone; (b) creating a shock wave in said cleaning zone by passing air at a pressure P_1 to a lower pressure P_0 where the ratio of P_0/P_1 is no greater than 0.528, and (e) directing said shock wave across the surface to be cleaned of said shaped article. The shock waves dislodge the contaminating particles on the article's surface and if desired, the dislodged particles may be removed by vacuuming the particles from the cleaning zone (see col. 2, lines 62-67 and col. 3, lines 1-5).

Apparatus for performing the cleaning operation comprises in combination support means to back the web and means for producing shock waves by a flow of air having at least sonic velocity, said flow means being located adjacent to the support means to allow the shock waves to flow upon the exposed surface of the web. The apparatus can have several embodiments as will be explained hereinafter. The main requirement of the apparatus is that it produce, direct, and maintain aerodynamic shock waves such that they flow on the surface to be

Art Unit: 1746

cleaned. These aerodynamic shock waves can be produced by either the expansion or compression of an air stream as it leaves a nozzle at sonic or supersonic velocity.

With respect to FIGURE 1, a web 10 of photographic base material is put into motion by suitable means (not shown) and it runs around a support roller 11 with the surface to be cleaned outwardly exposed. The support roller can be a simple idler roll or if desired it can be a vacuum roll, in any event its primary function is to support the web opposite the point of air impingement 12. Adjacent the supporting roller is located a nozzle housing 13. This housing is composed of a plenum 14 connected to a source of compressed air (not shown) and a nozzle section 15. The nozzle extends at least the width of the web surface to be cleaned. The nozzle section can have various configurations, the only requirement is that sonic or supersonic air velocity (i.e., above 1100 feet/sec.) be obtained when the air exits from the nozzle. To obtain sonic or supersonic air velocity the pressure ratio downstream P_o to upstream P_i of the nozzle must be equal to or less than the critical pressure ratio for air (0.528), (see col. 3, lines 10-66).

FIGURE 2 illustrates another embodiment; this apparatus in function is very similar to that of FIGURE 1, the basic differences being in the design, location and structure of nozzle and the direction of the flow of the jet. In this embodiment the nozzle housing 13 contains the plenum 14 and only one side 19 of the nozzle 15. The web 10 on the supporting roller 11 forms the other side 20 of the nozzle. In operation compressed air from the plenum enters the nozzle and is expanded to sonic or supersonic velocity as it exits at two locations, i.e., in effect there are two nozzles. The flow of the jets 16 from the nozzles is parallel to the surface of web and these jet contain the shock waves and patterns that dislodge the foreign matter from the

surface of the web. If desired, this embodiment can also have a vacuum system to prevent recontamination. FIGURE 3 illustrates another embodiment, i.e., one in which the use of compressed air is not necessary. In this apparatus, an area of the web 10 on the supporting roller 11 is surrounded by a housing 22 adjacent the roller. The housing contains a vacuum chamber 23 connected to a vacuum source (not shown). The housing does not fit tightly against the web on the roller. The ends 24 of the housing next to the web have the configuration of one side of a nozzle (see col. 4, lines 50-75). The reference fails to disclose a pump to create a flow of gas.

Cumming et al (4,194,232) disclose a pump for supplying compressed gas to create a gas flow (see col. 2, lines 29-30).

Lambel et al (4,059,858) disclose that gas pressure may be supplied from a pressure can or by pump (see abstract).

It would have been obvious at the time applicant invented the claimed apparatus and method to substitute a pump for flowing a gas instead of a compressed gas as disclosed by Cumming et al or Lambel et al into the apparatus and method of Wollman because Cumming et al and Lambel et al disclosed that compressed gas can be produced by a pump and gas produced by compressed gas or a pump would give the same results. Further, Wollman discloses to use a vacuum source which is usually a vacuum pump for removing particles from the surface wherein pressure in the tube is less than a pressure outside of the tube (see Fig. 3 and col. 4, lines 66-75). Wollman apparatus is capable of cleaning particular area at a greater extent than other area of the surface. It would have been obvious at the time applicant invented the claimed apparatus and method to duplicate the apparatus for cleaning the both sides of the article for the purpose of fast

and efficient cleaning and to save cleaning time. The article is a semiconductor wafer or a reticle has not given any patentable weight because it is an intended use of the apparatus.

Claims 8 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wollman in view of Cumming et al or Lambel et al. as applied to claim 7 and 24 above, and further in view of Gray and Banks et al.

Wollman in view of Cumming et al or Lambel et al. were discussed supra. However, the references fail to disclose means for moving across the surface in raster fashion.

Gray (5,350,480) discloses raster means for raster scanning on the surface.

Banks et al (5,560,781) disclose to move oxygen beam source to effectively raster over the painting t treat the entire surface uniformly (see col. 3, lines 25-30)

It would have been obvious at the time applicant invented the claimed apparatus and method to include means for raster as disclosed by Gray and Banks in the apparatus of Wollman for the purpose of removing the particulate uniformly from the surface.

Claims 9 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wollman in view of Cumming et al or Lambel et al. as applied to claim 7 and 24 above, and further in view of Yonemizu et al.

Wollman in view of Cumming et al or Lambel et al. were discussed supra. However, the references fail to disclose means for rotating the article and means for passing tube between a center of the article and a perimeter of the article.

Yonemizu et al (5,636,401) disclose means for rotating an article and means for moving cleaning member from center of the article to the perimeter of the article (see figs. 1, 2 and claims).

It would have been obvious at the time applicant invented the claimed apparatus and method to include means for rotating an article and means for moving the cleaning member from the center of the article to the perimeter of the article as disclosed by Yonemizu et al in the apparatus and method of Wollman for the purpose of uniformly removing the particulate from the surface of a circular article.

Claims 17 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wollman in view of Cumming et al or Lambel et al. as applied to claim 1 and 21 above, and further in view of Hilbig.

Wollman in view of Cumming et al or Lambel et al. were discussed supra. However, the references fail to disclose plurality of slots.

Hilbig (3,678,534) disclose plurality of slots in tubes 17 and 18 for applying gas which produces shock waves from the supersonic jets on the surface to be cleaned (see col. 1, lines 73-75 and claims).

It would have been obvious at the time applicant invented the claimed apparatus and method include plurality of slots as disclosed Hilbig into the apparatus and method of Wollman for the purpose of cover more area on the surface in one stroke.

Allowable Subject Matter

Claims 14-16, 30-32, and 35-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons For Allowable Subject Matter

The following is an Examiner's statement of reasons for the indication of allowable subject matter:

Art Unit: 1746

None of the prior art discloses or suggests an apparatus and method wherein a second tube concentrically inside the first tube for providing a second flow of gas toward the article surface or method of cleaning semiconductor or a reticle with shock waves produced by a flow of a gas by a pump through a tube.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saeed T. Chaudhry whose telephone number is (571) 272-1298. The examiner can normally be reached on Monday-Friday from 9:30 A.M. to 4:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Randy Gulakowski, can be reached on (571)-272-1302. The fax phone number for non-final is (703)-872-9306.

When filing a FAX in Gp 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1700.

Saeed T. Chaudhry
Patent Examiner
March 4, 2004


FRANKIE L. STINSON
PRIMARY EXAMINER
GROUP 3400-1700